

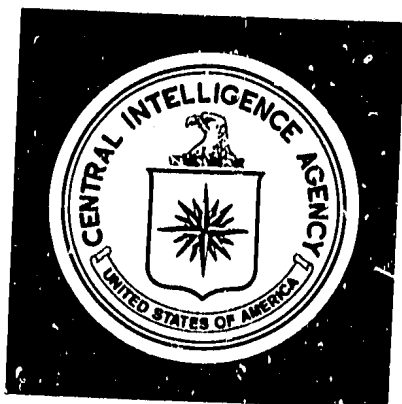
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Weekly Surveyor

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TSWS-10/75

10 March 1975

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WEEKLY SURVEYOR

USSR AND EASTERN EUROPE

The Soviets reportedly have developed and produced a two-stage hydraulic pump capable pumping coal from a depth of 1000 feet under the ground and through a coal transport pipeline. Such a pump appears to have great potential to revolutionize the coal mining extraction industry throughout the world. The major problem is the short life-span of the pump but this has prospects for improvement.

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disease resistant varieties of winter wheat poses a serious threat to Soviet winter wheat production whenever weather conditions favoring disease development occur.

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The Soviets are conducting experiments which create conditions of maximum complexity to assess performance of their radar operators under stress. In view of the lack of combat experience among most military personnel and the generally poor performance of cosmonauts under stress, it is probable that Soviet applied research on performance in stress situations will maintain a high priority.

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The lack of user acceptance evident in the Soviet automated system of management (ASU) indicates a lack of well trained system analysts. Problems such as this will drastically impair the use of the ASU as a tool for management of the Soviet economy.

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A recent Soviet article describes research on the communications signals of Black Sea bottlenose dolphins.

A Soviet report has confirmed the lack of disease resistance of one of the major winter wheat varieties and of two improved varieties derived from it. There is another major winter variety not reported, but it is known to be highly susceptible to rust diseases. The lack of

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It is believed that the Chinese can develop drilling operations from offshore platforms without using foreign experts. Despite a long interest, the Soviets are a poor second to the Chinese in terms of current understanding of the problems and state-of-the-art in offshore drilling technology.

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CHINA

The PRC issued a forecast for the early February earthquake in Liaoning Province which reportedly resulted in action by the local jurisdiction. The Chinese have a high priority earthquake prediction program but no significant advances have become apparent. The preciseness of the recent prediction was not announced. The exact time, place, and magnitude of a quake are the ultimate goal of all current programs.

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MIDDLE EAST

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AGROTECHNOLOGY AND FOOD RESOURCES

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Soviet Winter Wheat Varieties Exhibit High Disease Susceptibility: The Soviet test plots of the International Winter Wheat Performance Nursery revealed the development of leaf rust, stripe rust, stem rust and powdery mildew in the 1973-74 season. The Soviet varieties (Bezostaya-1, Avrora and Kavkaz) were among the highest in overall disease susceptibility of any of the 26 varieties tested. On 25 June 1974, Kavkaz and Avrora were 15 percent infected with leaf rust (the highest susceptibility) while Bezostaya-1 was rated as moderately susceptible. Bezostaya-1 also was susceptible to stem rust and to stripe rust (only 3 of the 26 tested varieties showed higher susceptibility to stripe rust). [REDACTED] Bezostaya-1, which has been among the highest yielding varieties in the international trials, is showing signs of breakdown to rust diseases. [REDACTED]

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Comment: This information, reported by the Soviets, confirms the lack of disease resistance of one of the major Soviet winter wheat varieties and of two improved varieties derived from it. The other major winter wheat variety was not included in the international trials, but it is known to be highly susceptible to rust diseases. The potentially serious impact on wheat production of this lack of disease resistance

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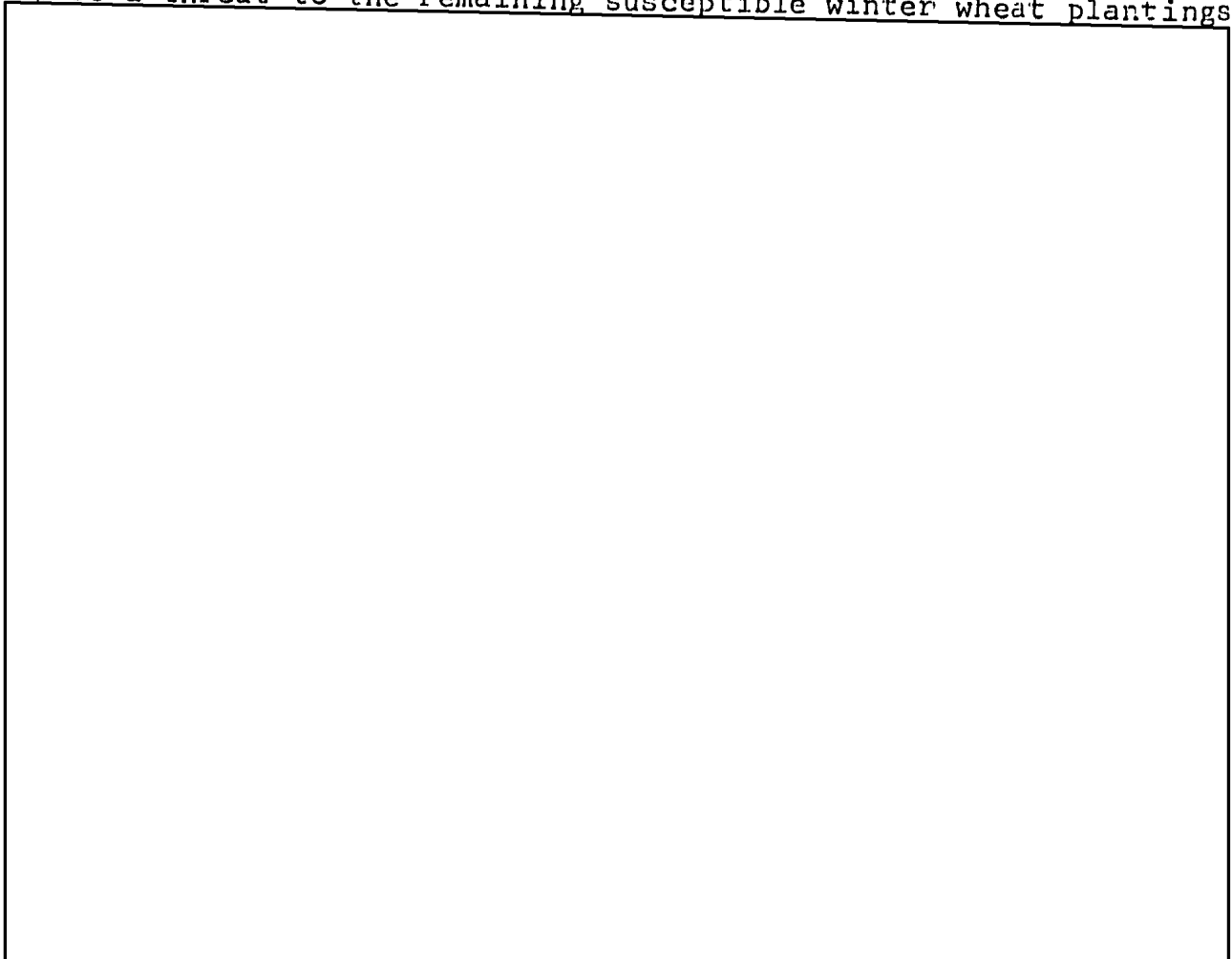
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emphasizes the Soviet need for priority development of winter wheat varieties with new resistance genes.

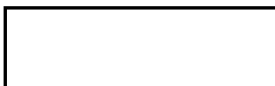
Bezostaya-1 and Mironovskay-808 each account for approximately 42 percent of the winter wheat area in the USSR. The varieties derived from Bezostaya-1, Aurora and Kavkaz, were planted on more than 2 million hectares in 1972, but their distribution apparently was reduced in 1974 because of heavy losses in yield sustained during the leaf rust disease outbreak in 1973.

Leaf rust is the most serious of rust disease of winter wheat in the USSR. Although Bezostaya-1 is susceptible to infection by leaf rust, at present it possesses tolerance to the prevalent leaf rust biotypes in the sense that yield losses are only moderate. Extensive infection of Bezostaya-1, however, could result in heavy rust spore production which would pose a threat to the remaining susceptible winter wheat plantings.

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BEHAVIORAL SCIENCES

Human Element Ignored in Developing Automated Management System for the Soviet Economy: V. A. Trapeznikov, First Deputy of the State Committee for Science and Technology, indicated in a recent lecture that insufficient attention had been devoted to the human element in developing the new economy-wide automated system of management (ASU). He stated that there is a lack of trained personnel who understand systems requirements and the sophisticated electronic equipment used in collecting and evaluating data. Operator personnel do not use the system for the purposes for which it was designed; they tend to mistrust system output, and man-machine subordination problems have not been solved.

Comment: The lack of user acceptance evident in the ASU indicates a lack of well trained Soviet systems analysts. Competent system analysts normally should contact each potential user and solicit their opinions on various systems design parameters to insure that the automated systems meet their operational requirements and that system output is displayed in meaningful and usable formats. This apparently has not been an integral part of ASU design.

The ASU is a large and complex system. Continued lack of solution for the reported man-machine interface problems will likely cause the system to fall short of designed operating goals in the immediate future and drastically impair its utility as a useful tool for management of the Soviet economy.

Soviet Use of Electrosleep (ES) Therapy Increases: S. R. Roytenburd, head of the Department of Electrosleep and Functional Diagnosis at the Polyclinic of the Moscow-Kursk Rail Sector has reported the use of ES therapy at 84 institute in Moscow. ES therapy at the Polyclinic of the Moscow-Kursk Rail Sector lasts a month and consists of a 60-minute session each day.

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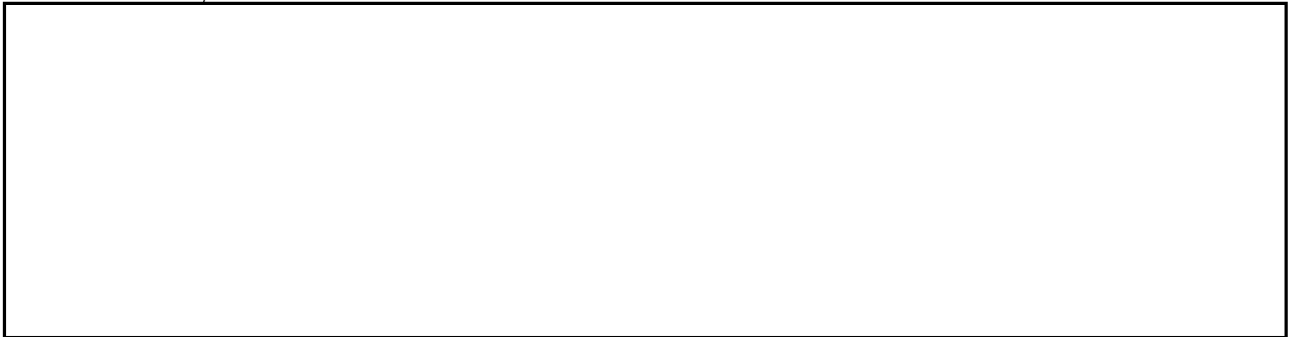
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The Soviets have claimed success in using ES for a large variety of therapeutic purposes since the early 1950s. Some of the types of patients thought by the Soviets to benefit from ES therapy include: insomniacs, those with some forms of depression and anxiety neurosis, patients with certain cardiovascular illnesses, women who develop toxemias in early pregnancy, and children with neuropsychiatric diseases. Soviet ES studies, however, have not been controlled carefully so that a placebo effect cannot be ruled out.

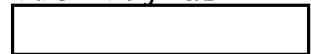
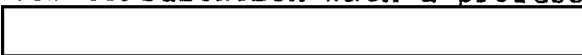
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Soviet Use Mild Electric Shock to Assess Performance of Radar Operators Under Stress: An open literature study by Colonel V. I. Kovalev examined a recent Soviet experiment designed to assess the performance of radar operators under combat conditions. The influence of danger on performance was simulated by experimentally controlled manipulations designed to evoke fright. An agitated state of alarm was produced by: (1) introducing planned radar malfunctions; (2) causing the operator to receive a slight electric shock when touching the antenna rotational speed switch during the normal course of duties; and, (3) simultaneously pairing a spark flash with the electric shock. According to Kovalev, experiments such as this, which create conditions of maximum complexity, approach the conditions of modern combat and therefore can be used to train operators to perform reliably under difficult conditions. Kovalev cautions that the employment of the electric shock is allowable only after consultation with a professional psychologist.

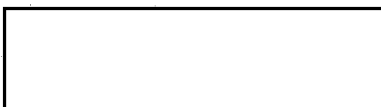
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Comment: This experiment is indicative of continued Soviet interests in upgrading performance of military personnel under stress conditions. Such stress training techniques provide a partial substitute for performance under actual combat conditions. Most Soviet military personnel lack actual combat experience.

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The tests described also might be applicable to the
selection and training of cosmonauts.

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LIFE SCIENCES

Soviet Military Research on Dolphin Communication Is Continuing:
A recent article describes research on the communications signals of Black Sea bottlenose dolphins (*Tursiops Truncatus Ponticus*). The paper concentrates on the classification of dolphin communication signals, analysis of the fine structure of such signals, and determination of the quantity of information transmitted. The experiment involved pairs of dolphins in isolated tanks whose acoustic signals were relayed electronically, thus allowing close monitoring of transmitted signal structure. The importance of high quality instrumentation in such experimentation is emphasized. Based on their experiments, the authors calculate an upper bound on the bit rate of dolphin communication that is close to the estimated bounds for the information acquisition rate of man.

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PHYSICAL SCIENCES AND TECHNOLOGIES

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Chinese Excel Soviets in Offshore Drilling Technology: [REDACTED]

[REDACTED] despite a long interest the Soviets are a poor second in terms of current understanding of the problems and state-of-the-art. With the same overt information, the Chinese have done a remarkable job of learning and evaluating the available equipment and technologies including minute details of competitive equipment and prices. The Soviets simply are attempting to buy complete systems to get the technology they lack. [REDACTED] 25X1

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Comment: [REDACTED]

It is believed that the Chinese can develop drilling operations from offshore platforms without using foreign experts. The Chinese have shopped for platforms and have collected related technology for about 10 years. They have shown some capability by drilling wells in the Po Hai Gulf with at least several native-built jackup-type platforms as well as one purchased from Japan. The latter purchase probably included training. In addition, the Chinese recently drilled a well in the open sea off their east coast with a new drillship.

In contrast, Soviet offshore drilling has been confined to the Caspian Sea where they are using two small Soviet-built platforms and a more advanced unit built in Holland--all jackup types. The Soviets have not built a drillship, and despite plans to build 10 more jackups designed after the Dutch platform, only one has been completed and is not yet operational. [REDACTED] 25X1

[REDACTED]

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Chinese Apparently Predicted Recent Earthquake: The official Chinese announcement of an earthquake in Liaoning Province on 4 February contained only the usual statement of date, location, magnitude, and general information on effects and actions by relief and scientific teams. Later broadcasts from the province on follow-up actions contain references to forecasts and preparations made before the quake. [REDACTED]

Comment: These references imply that a forecast for the quake was issued with enough confidence that local jurisdictions took measures to reduce damage which may have included evacuation of some areas. There has been no indication of the time or precision of the forecast.

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[REDACTED]

Soviets May Have Revolutionary Hydraulic Coal Pump: The Ministry of Chemical and Petroleum Machine Building of the USSR has successfully developed and produced a two-stage hydraulic pump capable of pumping coal from a depth of one thousand feet under the ground and through a coal transport pipeline, without "fining" or crushing it. By doing so, the pump eliminates the major problem of de-watering the "fine" or crushed coal. This two stage pump can handle coal chunks up to 4 inches in diameter. The major problem with the pump is its short lifespan. [REDACTED]

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Comment: This new hydraulic coal pump appears to have great potential to revolutionize the coal mining extraction industry, not only in the USSR but also in the US and other countries. It can handle nonfriable coals, fairly large chunks of coal, and it has the ability to separate process water for recycling and pollution prevention. The pump also appears suitable for use on slurry pipelines.

The design and manufacture of a good, reliable piece of equipment are continuing Soviet engineering weaknesses. Other technologically advanced countries should be able to develop the appropriate engineering solutions to overcome the problem related to the short lifespan once design details of this coal pump become available. [REDACTED]

[REDACTED]

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